How to Make Wine from Juice

By Paraglider

Why bother?

Now that wine is a supermarket commodity, what's the point in making your own? You will have your own reasons, but here are a few of mine:

- It's good fun, feels creative and fills the kitchen with summery smells.
- It's very cheap, wholesome, and surprisingly good.
- I live in an Islamic country where wine is *not* a supermarket commodity!

Will it be any good?

I'll be honest - it will taste like a decent *vin ordinaire*, and be none the worse for that. It will be on a par with the staple drink of millions of everyday folk throughout Europe. Because that's what we're making - everyday wine.

It is, of course, possible to make truly fine wine, but to do this you will need to follow a slightly more involved procedure:

- Buy a hillside with ideal aspect, soil and climate
- Terrace it and plant your vines
- Protect them from frosts, hailstorms, insects, neighbours
- Oh, and start about thirty years ago . . .

So, being realistic, our goal is a steady supply of wholesome and pleasant red, white and (if you really must) rose table wine.

What do I need to get started?

The good news is you hardly need any equipment at all. You will need:

- One 5 litre (or 1 gallon) plastic drinking water container. (Not 5 separate bottles)
- One plastic pouring funnel
- Four 1 litre (2 pint) cartons of red or white grape juice **with no preservatives**
- 750 grams (a pound and a half) of ordinary granulated white sugar
- One sachet of general purpose wine yeast

Wine Yeast?

This is important. Please do not try using baking yeast. It will ferment, but it will stop too soon, leaving you with an oversweet, under strength concoction, often with a bready smell. Much the same is true of brewer's yeast, except it will smell beery. What a surprise!

If you are lucky enough to have a winemaker's supplier nearby, that's where to get your wine yeast. Don't be intimidated by the expert salesman - one sachet of general purpose wine yeast is all you need. If he offers you Campden tablets, vitamin B6, a hydrometer, a thermometer, a fermentation trap and a snake of plastic tubing, just smile sweetly and say no.

If you have no local supplier, there are plenty of on-line sources available, listed under "winemaking supplies".

Let's get started

Your grape juice should be kept at room temperature, not in the fridge. If it's in the fridge, take it out now and do something else till tomorrow.

Drink the 5 litres of water. Most people prefer to do this over a few days. When the bottle is empty, don't rinse it out. It's clean. It was full of drinking water, remember?

DAY ONE:

Pour about half of one of your cartons of juice into the big bottle.

Add one teaspoonful of wine yeast, put the top on the bottle and shake it to buggery.

(***This is the correct technical term for this process as used by winemakers the world over, though a small handful still refer to aeration***).

Leave it in a warmish place and take the rest of the day off. (Yeast is a living organism. Its comfort zone is much like ours. Think shirt-sleeves temperatures. You don't need to keep it in the dark, but direct sunlight will spoil it.

DAY TWO:

You'll notice it will have started bubbling. Add the other half carton of juice and one full carton, so the bottle is now a little under half full. Tighten the bottle cap then **back it off half a turn.** This is very important. Fermentation produces a lot of carbon dioxide gas which must be allowed to escape.

Take a 2 litre coke bottle and do whatever you want with the contents. I'm told it goes well with a Big Mac, whatever that is. We need it empty, that's all.

Pour 750 grams (about a pound and a half) of sugar into the coke bottle. A plastic funnel makes this a lot easier. Pour boiled tap water or drinking water onto the sugar until the bottle is about half full (1 litre or 2 pints). Shake it until all the sugar is dissolved. Don't add it to the wine yet.

DAY FOUR OR FIVE:

By now, the wine should be fermenting well. Add one more carton of grape juice and all of the sugar syrup. The level should still be below the shoulder of the bottle. Swirl the bottle to mix in the sugar syrup. Tighten the bottle cap then **back it off half a turn**, as before. That's it for today. You should still have one unopened carton of grape juice.

DAY TEN OR SO:

The liveliest fermentation should have eased off by now, so it's safe to add the last carton of juice. The bottle should be filled to the bottom of the neck. Usual drill with the bottle cap. Now you just have to wait. Check the bottle cap every day, and watch for the bubbling showing signs of stopping, typically after two or three weeks.

FINALLY:

When the bubbling has stopped, or at least slowed right down to the occasional bubble, place the bottle in the fridge (not the freezer!) and leave it for about three days. The cold will halt the fermentation and will also help the yeast to settle to the bottom of the bottle.

Line up enough empty coke or water bottles to hold the wine. Very, very carefully, so as not to disturb the sediment, pour the wine into the bottles using the funnel. Get a friend to help by holding the bottles and moving the funnel from bottle to bottle. Fill all the bottles in a single pass, without un-tipping the fermenting bottle. This way, you won't disturb the sediment.

The wine can be drunk straight away, but it will improve in the bottle for several months. But don't even consider 'laying it down' or any such nonsense. It's not that sort of wine.

CHEERS! YOU'RE NOW A WINEMAKER.

NOTES: Adjust the Must!

What is a must?

The *must* is the name winemakers call the juice that is to be fermented into wine. Isn't that just a fancy name for juice? Yes and no. There are very few juices that will produce a good wine all by themselves. Most juices will be 'out of balance' in some way and will need adjusted before fermentation.

Sugar First

The sugar in the must raises its specific gravity (SG). Water has a SG of 1.000. A wine must will typically have a SG of around 1.080. This is the equivalent (approximately) of 200 grams of sugar per litre, or about 2 pounds per gallon.

If you were making wine from vegetables (some people do!) you could simply add 200 grams of sugar per litre every time, because vegetable juice is almost sugar free.

Fruit juice is trickier, because it already contains some sugar, but how much? Winemakers use a hydrometer to measure the SG of the must, and then work out how much extra sugar to add. The hydrometer is just a weighted hollow tube which floats upright in the must at a depth that depends on the SG. It is very easy to use, and no serious winemaker is without one.

If you don't want to use a hydrometer, a rule of thumb is:

- For supermarket grape juice, add approx 100 grams per litre
- For non-grape fruit juices, increase this to 150 grams per litre
- For vegetable juices, add the full 200 grams per litre

Acid Adjustment

Professional winemakers (and dedicated amateurs) check the acidity of the must by a process called titration. This determines the total amount of acid present, and is not the same as measuring pH, which is more a measure of the strength of the acid. A typical wine must will have a total acidity in the range 3.5 to 5.0 parts per thousand, with white wines generally higher than reds.

Acidity measurement and adjustment is one step too far for many amateurs. Fortunately, it isn't always necessary, if you follow these guidelines:

- Don't make wine with pure citrus fruit juice - it is too acidic
- Most grape juices will make acceptable wine without adjustment
- Always add lemon juice to vegetable musts - vegetables are almost acid free.

Sugar Content

It is the sugar in the must that converts to alcohol during fermentation. Too little sugar and the wine will be too weak. Under strength 'wine' barely tastes like wine at all, and is likely to go off, without enough alcohol to protect it from spoilage organisms. But too much sugar is equally bad. Carefully managed, it can produce a strong sweet dessert wine, but in practice it is quite likely to stop fermenting early, resulting in a weak, syrupy 'wine' suitable only for pouring over ice cream.

Fully ripened grapes can sometimes yield a must that contains enough natural sugar to produce a table wine. But most juices, whether purchased from a supermarket or expressed from your own

fruit, will benefit from adding sugar before fermentation. Use ordinary white granulated sugar, dissolved in water to make sugar syrup.

Acid Content (total acidity)

Don't panic - this isn't difficult! Yeast is a living organism and can only thrive in its preferred environment. A must with too little acid might still ferment, but will produce many unpleasant tastes and smells. Too much acid is less harmful. The result will usually still be wholesome, but it will have that sharp taste sometimes found in low quality white wines, especially from colder countries like Germany.

Grapes contain natural tartaric and malic acids. Apples contain mainly malic acid, and citrus fruits contain citric acid. Even if you don't want to measure the acidity of a must, you should always taste it before fermentation. Acid gives sharpness to the taste. A must that is low in acid will have a flat, puddingy taste. Adding fresh lemon juice is a quick and easy way to increase acidity if you feel uncomfortable dealing with powdered tartaric acid.

As a general rule, white wine should be more acidic than red, and totally dry wines less acidic than sweeter ones, where the extra acid balances the sweetness and lends freshness to the taste.

Yeast and Fermentation

Wine Yeast

Don't let anyone tell you can make wine without yeast. If you don't add your choice of wine yeast, the must will 'ferment' under the control of some airborne (or fly borne) wild yeast. The results will be unpredictable at best, and quite probably undrinkable or even dangerous to health.

A wine must is a perfect breeding ground for micro-organisms and will be colonized by the first arrival. If you make sure this is your wine yeast, it will take over the must and effectively exclude all competitors.

Fermentation - the basics

During fermentation, the complex sugars in the must are broken down to simple sugars, maltose and dextrose, which are in turn converted to alcohol (ethanol) and carbon dioxide. Strictly, it is not the yeast itself that does this, but enzymes released by the yeast. The process is in three stages:

1. Growth Phase (Aerobic)

The yeast cells multiply rapidly in the must, in the presence of oxygen. Winemakers talk about 'starting the yeast'. The yeast is added to a small quantity of the must and shaken vigorously which helps to hydrate the dried yeast and also dissolves oxygen in the must which the yeast uses in replication. Not much alcohol or carbon dioxide is produced during this stage, which typically

lasts for a day or two. The active starter is then added to the bulk of the must which it proceeds to colonize.

2. Main Phase (Anaerobic)

Once the yeast has used up the dissolved oxygen, the main anaerobic phase begins. Enzymes released by the yeast cells cause the breakdown of sugars in the must to form alcohol and carbon dioxide. After a few days of extremely vigorous fermentation characterized by a heavy frothing, the processes slow down to a steady bubbling, which will last two to three weeks.

3. Decay Phase (Anaerobic)

Eventually, the fermentation slows down to the occasional bubble, or stops completely. There are two good reasons for this:

- All the dissolved sugar has been converted to alcohol. With no 'food' left, the yeast dies
- There is still some sugar left, but the must now exceeds the yeast's alcohol tolerance. This typically happens around 13% alcohol by volume (ABV) though this depends on the yeast variety

Occasionally, fermentation can stop early, but this shouldn't happen with a good yeast and a balanced must.

Control the Fermentation

The key to success is to look after your yeast. Yeast is a living organism. Treat it well and it will repay your kindness tenfold.

Yeast enjoys:

- a balanced must (see above)
- an even temperature around 22C (72F)

Yeast dislikes:

- direct sunlight
- hot, cold or very varied temperature

Yeast Starter (phase 1)

- add yeast to about one tenth of the must
- shake well to aerate it
- keep it warm and out of the sun
- after 24 hours add to the main must

Main Fermentation (phase 2)

- maintain steady temperature
- no direct sunlight

To Finish (phase 3 end)

- place in refrigerator for 3 days
- sediment settles
- wine falls clear

Stabilize and Mature

Yeast activity may be over, but that does not mean the new wine is stable. If you intend to drink the wine within weeks, that's fine. Young juice wines can be very palatable. But if you want to mature your wine, which is the only way it will reach its full potential, it is not sufficient just to stash it away and hope for the best. However, maturing is a topic in its own right, and will be the subject of another Paraglider hub. Thanks for the read!

My Sources

I learned winemaking in the early seventies. After much trial and error, I read two great books which steered me away from recipes and towards understanding:

- Scientific Winemaking - Made Easy, by J R Mitchell
- Progressive Winemaking, by Brian Adam and Peter Duncan

I like to think that if any of these excellent gentlemen ever read this hub, they would acknowledge that I have remembered at least a little of their teaching. Cheers!

Q & A

Q: I was asked elsewhere about **the "technique" of stretching a balloon over the neck** of a fermenting vessel as a way of managing the fermentation gases. NEVER DO THIS. Here's why:

A: We're not talking about dry clean Carbon Dioxide gas here. The balloon will inflate with carbon dioxide, water vapour, spray from bursting bubbles, and various trace gases that are better out than in, e.g. hydrogen sulphide. This cocktail will coat the inside of the balloon. It is acidic (carbonic acid) and will attack the rubber of the balloon. Then it will drip down the inside of the balloon and end up back in your wine, giving all sorts of off flavours.

Either use the loose screw top method described in my hub (above) or, if you are using a glass demijohn, use a proper fermentation trap. Balloons are for parties, ok?

The point of the airlock is to starve the yeast of oxygen so that it produces alcohol rather than something else. Not to mention you keep out spores and other nasties. if you are using modern disposable plastic drinking water containers, it is sufficient to use the screw cap, *backed off half a turn* to allow the gas to escape through the screw thread.

Q: **Couldn't I technically add everything at once** instead of exposing the mix to the air so much? I was thinking about getting the juice room temp., then adding the sugar, stir the mix, and finally add yeast, shake, put my top fitted with an airlock and forget about it. Wouldn't this work just as efficiently???

A: Hi Joe - no, it would actually be less efficient, for many reasons. If you add yeast to a full gallon it will take longer to get started. It's much better to start the yeast in about a pint of well aerated juice. Also, by your method, because your jar is full, when the fermentation does get going, it is very likely to froth right through the fermentation trap, making a horrible mess. In my method, though the jar is not full until quite late in the proceedings, there is not exposure to the air, because, from day one, the wine is protected by a blanket of Carbon Dioxide. (By the way, you should never just forget about airlocks, because they dry out if you don't attend to them regularly. I prefer the loose cap method for juice wines). Thanks for the question :)

Q: U are right about the frothing...I filled one of the jugs almost to the top, and found a little mess this morning. The other jug I'm making is doing just fine. (It's not all the way filled like the other) I was thinking about dumping some out or just leaving it and just dealing with it until the fermentation calms down. All and all, the fermentation seems to be doing very well! Another concern I have is about bacteria. I forgot to sanitize one of my airlocks and a measuring cup on accident. The measuring cup was rinsed with very hot water then boiling hot sugar water was poured in it. (I was using the measuring cup instead of a funnel because it had a spout) **How will I know if bacteria infested my wine**?

A: You are unlikely to get bacterial spoilage in a wine made from pre-packed juice, especially if you use new drinking water containers as suggested. If you are using fresh fruit you have to be far more careful with sterilization, because most spoilage comes from infection of the original fruit, or from fruit flies attracted to the pulp. If you think about it, what self respecting fruit fly is going to land on a dry measuring cup? Once the yeast takes hold, you are usually pretty safe. Let me know how it turns out, ok?

Q: **Does it ferment quicker when heated**...I was reading most reds are kept between the mid 70s to lower 80s during fermentation. Anyhow, mine has been at 78 degrees roughly...Cracked open the jug today to get a little smell, and it smelled like it had high alcohol content already. (sweet but strong!) I have a little heater blowing in my closet, or else it seems like it would be too cold. My packet of yeast said to keep it between 64-86. The other guy said his temp was at 20...I think the yeast would die, no? Hooray for trial and error and supply stores! Keep ya updated.

A: Yes, it goes faster when warm, but only up to about 80. Much above that, you risk killing the yeast. Remember that the fermentation releases heat, so the fermenting wine can easily rise a few degrees higher than the ambient temperature. I'm pretty sure the 20 means 20 Celsius = 68 Fahrenheit, which is fine.

Q: Hi Paraglider, I hope I'm not bothering you with all the questions, but I've got another. I'm not sure what's gone wrong but **my three bottles of wine seem to have all gone bad**. I've tried to figure out what I did wrong but with my limited knowledge it's hard to find out. They have a sort of rotting smell, and I almost was sick from having a sip from one. I did not transfer the wine from its original container until this week, so it was sitting with the slime in the bottom for quite a while after fermentation was done. Would that have caused this? I'm quite disappointed, but not giving up yet! Thanks again, KiefMan.

A: That's a shame because it seemed to be going well. It's quite important to get the fermenting bottle into the fridge as soon as the fermentation has stopped, to clear the wine and pour it off the sediment as soon as possible. The sediment is not stable, and will break down (start to rot) if you leave it in there. The other thing is, after getting rid of the sediment, the wine should not be open to the air, i.e. the bottles should be capped.

Q: **How much of a difference does it honestly make using wine yeast**? If I can get away with bread yeast it would make the process a lot simpler.

A: Any wine yeast can deliver 12 - 13 % alcohol without sticking (if the must is properly balanced). Bread yeast is not guaranteed to go all the way. It might, but it might not. It's not what it's bred for, after all. Also, wine yeast tends to be more sedimentary - i.e. it clears better.

Q: **I was looking for a way to make mulberry wine** and found your site. Just what my husband and I are looking for. Simple, thrifty, healthy and down to earth good. My question is can I use mulberry juice instead? If so how many pounds of berries do I need and how should I extract the juice from them for making wine? Plus I have also been told I need to add some grape juice as mulberry wine isn't good on its own. Is that true and if so what ratio of mulberry juice to grape juice should I use?

A: If you want to use the method on this page (good if you want the wine to be ready for early drinking) then do this - Follow the procedure using supermarket grape juice until the start of the section called "DAY 10 or so". Then switch to mulberry juice. For a table wine, 1 litre mulberry to 3 litre grape is good. You'll still get the mulberry flavor without it tasting like a cordial. The mulberries should be completely fresh and very ripe but not over-ripe. Depending on how juicy they are, you'll need 3 - 4 pounds. Put them in a big plastic bag and squeeze by hand till the juice is running. Pour it through a nylon sieve (not metal) Don't try to get every last drop of muddy juice, and don't filter it or it will lose its freshness. Cover it and let it settle for half an hour, then add it to the fermenting must. Then carry on with the method as described.

Now, if you really have huge mulberry crop, you might like to try a dessert-style wine, but first you'll need to learn about pulp fermentation and how to use sulfites. I'd advise leaving that till you've had a few successes with juice.

Q: Sounds pretty good!!!! But **I'm thinking about using pineapple juice** and butter as for the fruit content, do you think that's a good idea?

A: I would steer clear of pineapple juice, because it's not really a juice! Technically, it's a colloid - tiny particles of pineapple solids suspended in an almost clear watery 'liquor'. If you like pineapple flavour, use 3 cartons of white grape juice to 1 carton pineapple. That way, you'll still get a wine, but with a pineapple scent & flavour. In the method above, make the pineapple the final carton. And let us know how it goes, ok? (oh, and butter - no!!!)

Q: **How drunk will this wine get you**?

A: That depends on how much you drink! It is the same strength as most commercial wine. That's about 3 times stronger than beer and 1/3 as strong as spirits. But that's not really the point, is it?

Q: **Have you ever tried tomato wine**? It looks and tastes like tequila. It's very strong, and not my personal favorite, but it is interesting. :)

A: I used to make a lot for fruit blend wines at home, but here in the Gulf I'm not wanting to amass equipment so I just stick to the supermarket juices. About tomato wine - the strength can only come from the sugar, and the yeast can only reach about 14% before it dies. A lot of the stories about very strong home-made wines are a bit misleading. The truth is that some are slightly poisonous and so give a raging hangover, but that's not quite the same as strength.

Q: Hi Paraglider, we are also living in a dry country and are looking to use your recipe here. We do have a primary/carboy though, (sneaky buggers aren't we?), and are hoping to use these rather than just 1 gallon jugs. Have you any experience with increasing the quantity you are making per batch with this recipe? Also, **how necessary is it to refrigerate**, (primary is a bit large for the fridge.)? We are thinking we can just go ahead in the primary and then transfer out into the carboy without refrigeration once the fermentation has slowed and SG looks good, (yeah we have the hydrometer as well), but would like an opinion from someone who has a clue.

A: Refrigeration is good but not essential. Two alternatives are - a second racking after about a month, or, an extra week or so before you decide it has finished. (Or pick your season - most countries have a cold snap, even Qatar!)

Q: Great advice Paraglider! **I Have been making wine on and off over the years** and had some good results and bad ones. This juice method only occurred to me yesterday so I was glad I came across you! Will let you know how it turns out!

A: My juice method is pretty reliable for a good standard everyday wine. Whole fruit wines can reach a higher standard but there's more to go wrong too. Good luck.

Q: What is the quickest way to make wine?

A: The quickest way is to let other people do the hard work for you! Buy supermarket grape juice, general purpose wine yeast and granulated sugar, and follow the step by step instructions above. This will take 3 to 5 weeks, depending on temperature. Beware of Internet recipes for one-week or two-week wine. I've never seen one that wasn't seriously flawed. I've seen some that were positively dangerous!

Q: What is the easiest wine to make?

A: Still dry table wine. Table wine is around 12% alcohol, well within the tolerance of a good wine yeast. Dry wines are easier because, when all the sugar is used up, the fermentation stops by itself. Sweet wines have to be stopped artificially. Strong dessert wines need special techniques to ferment beyond about 14%. Sparkling wines need particular care and attention. But this is all good news - the easiest wine to make is also the most popular type!

Q: What are the calories in wine as compared to other alcoholic drinks?

A: **The calories in some common alcoholic drinks**

- 1 standard bottle or can of beer (not strong beer) =150 calories
- 1 ounce of liquor (without mixer, which can add a lot of calories) += 65 calories
- 1 ounce of after dinner liqueurs = 188 calories
- 1 glass of red wine (125 ml) = 80 calories
- 1 glass of dry white wine (125 ml) = 75 calories

Q: Is it legal to make wine at home?

A: In the UK, it is legal to make your own wine and beer, but not to distill the spirit from it. It is prohibited to sell it without a special license. Similar rules apply in most non-Islamic countries, but if in doubt it is best to check. It is no part of Paraglider's mission to land his readers in jail!

Q: Does wine really improve with age?

A: Yes. The older I get, the more I like it! Seriously though, all wine will improve with a little ageing, but long ageing will only help a wine that has been specifically designed to be aged, and such a wine will often be pretty unpalatable until it has been aged. Red wines generally need a longer rest than whites, because of their higher tannin content.

Q: Which is stronger, homemade or bought wine?

A: There is no difference if the home wine recipe is well designed and executed. So-called yeast less or sugar-free recipes turn out quite a lot weaker than bought wines. The folk tales of Grandpa's parsnip wine that was as strong as whisky have two explanations: 1) the stuff tasted foul and gave you a raging headache because it was poisonous, not strong; 2) the old man was secretly distilling it in the potting shed. Naughty Grandpa!

Q: Can I use vegetable juices?

A: Yes, but not on their own. you will need to add sugar and acid because vegetables are very low in both. Or you can mix vegetable and fruit juices. Be a little careful with vegetable-based wines as they can sometimes contain undesirable alcohols as well as the ethanol. Even traces of methanol are dangerous to health.

Q: Can I make wine without using yeast?

A: No. A sweet fruit juice might start fermenting all by itself, but that's only because some airborne wild yeast has contaminated it. Some wild yeasts are capable of producing wine, but most are not. It is far better and safer to use your choice of wine yeast and be in control of the process.

Q: Can I use baking yeast (bread yeast)?

A: It's better than trusting to luck with wild yeasts, but it's still not a good idea. Baking yeast will certainly start your fermentation, but it has a low alcohol tolerance, and will die before completing the job. This will leave you with a wine that is too sweet. It's much better to use a good quality wine yeast.

Q: What exactly does the yeast do?

A: It does two things. At first, it multiplies by replication, vastly increasing its numbers, and in the process it uses up all the oxygen in the juice. Then it starts to release enzymes which break down the sugars to form alcohol and carbon dioxide gas. That is why fermenting juices froth and bubble.

Q: How much yeast should I add?

A: You don't need much, because it grows by itself. But don't just add it straight to the juice. Add about a teaspoonful of dried All-Purpose Wine Yeast to about half a pint of the juice. Shake

it, cover it, and leave it in a warm place for about 24 hours. When it has come alive, you can add the rest of the juice.

Q: Where can I buy wine yeast?

A: If you don't have a winemaking supplier near you, there are plenty that do mail order. Google for winemaking supplies. And choose 'all purpose' or 'general purpose' wine yeast.

Q: Why do I need to add anything to my wine?

A: In some cases, you don't. You can make dry table wine from fruit juice, sugar, yeast, and nothing else. And it's satisfying to do so. But there are two main reasons why winemakers use additives. 1) Not all juices contain enough natural nutrients to keep the yeast alive and healthy throughout the process. 2) Wine that is to be matured can benefit from added antioxidants to delay the natural oxidation process until ageing is well advanced.

Q: What is yeast nutrient? When do I use it?

A: Yeast nutrient is the winemaking equivalent of garden fertilizer. Yeast is a single cell 'plant' that, just like garden vegetables, needs the right nutrition. In particular, it needs a source of *fermentable nitrogen*. If this is lacking, the fermentation may stop completely, or it may take a wrong turning and start producing hydrogen sulphide, the bad egg gas. You can obtain yeast nutrient from any winemaking supplier. For quantity, follow the manufacturer's instructions, and always add it to the juice before starting the fermentation.

Q: What is DAP?

A: DAP is diammonium phosphate. It is the principal ingredient of yeast nutrient. Only specialists and professional winemakers would have reasons to use DAP on its own. Just stick to general purpose yeast nutrient.

Q: What is pectolase used for?

A: Pectolase, or pectolytic enzyme, breaks down pectin in a wine must. Pectin makes jams and jellies set, but is not helpful in wine as it can form a haze that will not settle. Juice wines usually don't need pectolase, but pulp-fermented wines may extract too much pectin from the fruit, causing trouble later. Pectolase added to the pulp has two effects - it reduces the risk of pectin hazes and also increases the juice yield from the pulp, as the pectolase breaks down the cell walls and helps liquefy the pulp.

Q: What are sulphites? Do I need to use them?

A: Sulphites are added to wine as sodium metabisulphite or potassium metabisulphite. Both chemicals act as a source of free sulphite ions in the juice. The sulphite does two useful things. 1) It prevents contamination of the juice by wild yeasts and other spoilage organisms. 2) It acts as an antioxidant, by sacrificially oxidizing itself, forming sulphates in the process. Without sulphites, white wines tend to go brown and flat, like a sliced apple.

If you are making table wine from supermarket juices, for early drinking, then you do not need to use sulphites. But if you are using fruit or vegetables, or if you intend maturing the wine, careful use of sulphites is recommended.

Q: What are Campden tablets?

A: Campden tablets are aspirin-sized pills of potassium metabisulphite. They offer the most convenient way of adding a controlled quantity of sulphite to a wine. But they are not very soluble and should always be crushed (between two spoons) and dissolved in a little water before adding to the wine. *Keep Campden tablets out of the reach of children.*

Q: Doesn't sulphite smell bad?

A: Sulphur dioxide is a poisonous gas with a sharp, pungent smell. If you sulphite a wine at the end of fermentation, to stabilize it and prevent early oxidation, then you should not be in a hurry to drink it. As the wine matures the sulphite level drops steadily. When the wine is ready for drinking, there should be no discernable sulphur dioxide smell. Sometimes you can smell sulphite in commercial wines, and usually this is because they have been rushed to the market too soon.

Q: Is sulphite the only preservative used?

A: No. Some winemakers add potassium sorbate at the end of fermentation. This forms sorbic acid in the wine, which is a yeast inhibitor. You don't need it in dry wines, but it can be used to prevent intended semi-sweet or sweet wines from continuing to ferment past the desired end point. Note that sorbate is genuinely a preservative, whereas sulphite is technically a retardant but still an active part of the winemaking and maturing process.

Q: What are finings? Do I need to add them?

A: Finings help a wine to clear. Most wines will fall clear by themselves, especially if you refrigerate them for a few days. But some may form a haze which refuses to settle out. Finings added to the wine can help the tiny haze particles to coagulate and fall as sediment, or in some cases to adhere to the finings particles and settle out together. There are problems though. Different types of haze may require different finings, and the wrong addition can simply add to the haze.

In fact there are two broad types of finings: organic, and inorganic or mineral. Organic finings (e.g. egg white, casein) react chemically with the haze and therefore have to be selected and measured with knowledge and care. Mineral finings are little more than insoluble fine heavy particles that slowly fall through the wine collecting the haze in passing. They are much easier to use.

Q: What is Bentonite?

A: It is a mineral earth. It is the easiest and usually the most effective inorganic fining agent. If you want to use finings and don't have a degree in biochemistry, stick with Bentonite! Some winemakers add Bentonite to every fermentation, as a precaution, but I don't recommend this, because, though completely harmless, Bentonite will remove some of the more subtle flavours and scents. Note - Bentonite, though technically an additive, is not an ingredient, as it falls to the bottom and is not present in the finished wine.

Q: What equipment do I need?

A: To get started, the only equipment you need is a plastic pouring funnel and a five litre (one gallon) drinking water container. But you do need a good reliable method. If you take up the hobby seriously, you will want a glass thermometer and a hydrometer (see below). You might want an electric heating mat to keep your fermentation warm, but it is really better just to make your wine in a warm place. When you start designing your own recipes, you should buy an acid testing kit.

Q: What is a hydrometer used for?

A: A hydrometer is a weighted tube that floats upright, half in, half out of the juice. It has a scale on it which lets you read the Specific Gravity (SG), or density of the juice, as it floats higher in denser liquids. The SG of a juice depends on how much sugar it contains, so the hydrometer is effectively measuring the sugar content of the juice. During fermentation, as the sugar is converted to alcohol, the SG becomes less. The hydrometer is again used to monitor the progress of the fermentation. Finally, it is used to confirm when fermentation has stopped, and the comparison of initial and final SG is used to calculate the alcoholic strength of the finished wine. (For more details, see the section on Technique Questions)

Q: What is a vinometer?

A: This is an instrument that is supposed to measure the alcoholic strength of a finished wine. It relies on *capillary action* - the tendency of a liquid to climb inside a narrow tube, or capillary, to a height that depends on various factors, including surface tension, viscosity and specific gravity. It works reasonably well with very dry wines, but with sweeter wines the dissolved sugar affects the result. Being a capillary, it is a difficult instrument to keep clean, and any deposits on the inside will also affect the capillary action. Don't bother buying a vinometer. The right way to measure alcohol content is with before and after hydrometer readings.

Q: What is a fermentation trap?

A: This is a device to allow fermentation gases (carbon dioxide) to escape from the fermenting vessel while denying access to airborne micro-organisms, dust particles and even fruit flies and other insects that can be attracted by the aroma. There are several designs, but most rely on causing the gases to bubble through water (or sterilizing solution). You need one if you are fermenting in the traditional glass demijohn fitted with a cork, but if you are using modern disposable plastic drinking water containers, it is sufficient to use the screw cap, *backed off half a turn* to allow the gas to escape through the screw thread. Nothing can enter against the steady stream of carbon dioxide.

Q: What is the best kind of fermentation heater?

A: The two commonest types are electric mats and electric belts. The mat is easier to use. It is like a small electric blanket that you slip underneath the fermentation vessel. They can be quite useful, especially in the early stages when you want to help the process along, but later, when a sediment starts to form, applying heat directly below the sediment can release off flavours into the wine. The fermentation belt solves this problem, as it is wrapped round the outside of the vessel just above the sedimentation level. So, the belt is a better choice than the mat, but better still is simply to control the ambient temperature and use no heaters at all.

Q: What is a fermentation jacket?

A: This is just a lagged insulating jacket that wraps around the fermentation vessel. It relies on maintaining a good temperature by trapping the heat generated naturally by the fermentation process. Unfortunately it can be self defeating as the trapped heat can lead to temperatures that the yeast can't survive. Also, the jacket takes away the pleasurable and educational experience of *watching* the fermentation. Lagging jackets are best left to hot-water cylinders!

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